PACIFIC POWER
A DIVISION OF PACIFICORP

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November 19, 2015

VIA ELECTRONIC FILING

Steven V. King
Executive Director and Secretary
Washington Utilities and Transportation Commission
1300 S. Evergreen Park Drive SW
PO Box 47250
Olympia, WA 98504 – 7250

RE: Advice 15-04—Schedule 107—Refrigerator Recycling Program Service Optional for Qualifying Customers

Pacific Power & Light Company, a division of PacifiCorp (Pacific Power or Company), submits this advice filing to cancel the following tariff sheet in accordance with RCW 80.28.050 and WAC chapter 480-80. The Company respectfully requests an effective date of January 1, 2016.

Eighth Revision of Sheet No. INDEX.3		Tariff Index
CANCEL Second Revision to Sheet No. 107.1	Schedule 107	Refrigerator Recycling Program Service Optional for Qualifying Customers

Background
The Refrigerator Recycling Program (Program) has been offered to Washington customers since 2005 and has acquired cost-effective electric savings by recycling older, less-efficient refrigerators and freezers from residential homes, and more recently from businesses locations and retailers who sell new appliances.

Unit energy savings delivered by this program were directly tied to: a) the age of the appliances recycled; b) what customers would do in the absence of the program; and c) what the program helps customers to do; i.e., purchase a replacement appliance. The Company has regularly evaluated this program (as well as other programs in the portfolio) to ensure the most current information for planning and savings reporting is available.

On both a regional and national level, evaluation methodologies used to measure the impacts from appliance recycling programs have evolved since this program was originally launched in Washington. In the Northwest, the Regional Technical Forum (RTF) has moved from a savings calculator to establishing a unit energy savings value in June 2005. In 2010 the RTF started to consider what would happen in the absence of the program. In April 2013, the National Renewable Energy Laboratory (NREL) funded by the US Department of Energy published their first sets of protocols for determining energy savings. These protocols are part of a larger effort known as the Uniform Methods Project (UMP). The refrigerator recycling protocol was among the first set of protocols. In 2013, the RTF aligned their methodology with the UMP protocol

when the organization updated the unit energy savings values. A summary of the most recent evaluations is provided below.

Program year(s)	Report date	Evaluation firm
2006-2008	September 22, 2010	Cadmus
2009-2010	January 6, 2012	Cadmus
2011-2012	October 23, 2013	Cadmus
2013-2014	September 18, 2015 (results memo)	Cadmus

The 2011-2012 evaluation used the UMP and RTF protocols to determine updated unit energy savings for recycled refrigerators and freezers. The 2013-2014 evaluation currently underway follows the same approach.

During preparation of the 2016-2025 conservation forecast, the Company compared the unit energy savings used in the conservation potential assessment (CPA) with the updated information from the in-progress 2013-2014 program impact evaluation. The CPA used unit energy savings values of 583 kWh for refrigerators and 495 kWh for freezers from the previous program impact evaluation, which used a methodology consistent with the RTF methodology.

In August 2015, the Company received draft evaluation results using the UMP methodology for appliance recycling, which is consistent with the current RTF methodology. This evaluation used a set of legacy RTF values (50% "yes", 50% "no") in response to a protocol question about whether the "would-be acquirer finds an alternate unit." The revised unit energy savings for refrigerators declined to 328 kWh. Freezers declined to 321 kWh. Table 10 in the Cadmus September 18, 2015 Results Memo, included as Attachment 1, provides additional information on the key factors contributing to these revised values.

During the latter part of the conservation forecast process (August/September 2015), the RTF updated their unit energy savings for appliance recycling. While the Company used the RTF methodology, but not the unit energy savings values (which are more applicable to the region as a whole), the Company's evaluation team at Cadmus stayed connected with the RTF update process to ensure alignment. The RTF updates, approved at the September meeting changed the values incorporated in the "would-be acquirer" program logic question to 75% "yes", 25% "no", When these factors were incorporated into the Company's evaluation results, they further lowered the unit energy savings to 299 kWh for refrigerators and 265 kWh for freezers. Table 11 in Attachment 1 provides additional information on key factors contributing to these revised values.

The Company and the Washington Demand-side Management (DSM) Advisory group (Advisory Group) discussed the material decline in current evaluated unit energy savings values relative to the 2014-2015 biennium and the comparable results generated by the RTF.[1] The group agreed on the need to assess cost effectiveness of the measure to inform the decision about leaving the savings in the 2016-2025 forecast and including the program in the 2016-2017 DSM business plan. The Company evaluated cost effectiveness by appliance and channel (i.e., customer or

[1] The Company reviewed this information with the Advisory Group in meetings held August 20, 2015, and September 14, 2015.

retailer pick-up) basis using the 2015 Class 2 DSM decrement values. When the analysis used unit energy savings with the UMP assumptions for "would-be-acquirer" (generating highest unit energy savings), three of the four appliance/channel configurations were not cost-effective. The remaining configuration (refrigerator/retailer pick-up) was not cost effective when the unit energy savings associated with the RTF values for "would-be acquirer" were used. The benefit/cost results are provided in the Navigant memo dated September 10, 2015, which is included as Attachment 2. Based on the results of the cost effectiveness analysis, the Advisory group was supportive of the Company's decision to remove the savings from the conservation forecast and remove the program from the business plan.

The Company is providing notice of the proposed change to affected customers in accordance with WAC 480-100-194(2). The customer notice is enclosed as Attachment 3.

It is respectfully requested that all formal correspondence and Staff requests regarding this filing be addressed to:

By e-mail (preferred): datarequest@pacificorp.com

By regular mail: Data Request Response Center
PacifiCorp
825 NE Multnomah, Suite 2000
Portland, Oregon, 97232

Please direct any informal inquiries regarding this filing to Ariel Son at (503) 813-5410.

Sincerely,

R. Bryce Dalley /AS

R. Bryce Dalley
Vice President, Regulation

Enclosures:
Attachment 1: Cadmus September 18, 2015 Results Memo
Attachment 2: Navigant memo dated September 10, 2015
Attachment 3: Customer Notice

The proposed tariff sheet to be revised in Pacific Power and Light Company's currently effective Tariff WN U-75 are designated as follows:

Eighth Revision of Sheet No. INDEX.3		Tariff Index
CANCEL Second Revision to Sheet No. 107.1	Schedule 107	Refrigerator Recycling Program Service Optional for Qualifying Customers

Tariff Index

NOTE: *No New Service

(continued)

PACIFIC POWER & LIGHT COMPANY

WN U-75

Second Revision to Sheet No. 107.1
Canceling First Revision to Sheet No. 107.1

Schedule 107
REFRIGERATOR RECYCLING PROGRAM
SERVICE OPTIONAL FOR QUALIFYING CUSTOMERS

PURPOSE:

Service under this tariff is intended to reduce residential refrigeration loads through the removal and recycling of inefficient models.

AVAILABLE:

In all territory served by Pacific Power (Company) in the State of Washington.

APPLICABLE:

To customers, or property owners, landlords, property management companies and homeowner associations not listed as the primary account holder, in all service territory served by the Company in Washington.

CUSTOMER PARTICIPATION:

Customer participation is voluntary and is initiated by contacting a specified toll-free number or website.

DESCRIPTION:

Customers receive a $30 incentive to discontinue use of their working second refrigerators and/or freezers or to replace their working primary refrigerators and freezers with new more efficient models. To qualify for the incentive, customers must give up their appliances for recycling. Appliances will be collected and recycled to ensure they are not resold on the secondary market. Company may offer a packet with written energy efficiency information and instant savings measures. Participating retailers will receive an incentive of up to $20 for each eligible refrigerator and/or freezer.

QUALIFYING EQUIPMENT:

Working residential refrigerators and freezers that are a minimum of 10 cubic feet and a maximum of 32 cubic feet in size utilizing inside measurements.

PROVISIONS OF SERVICE:

Incentives will be available for a maximum of two appliances per qualifying customer per year. Incentive checks will be mailed within 30 days of the appliance collection date.

Company and/or Program Administrator may employ a variety of quality assurance techniques during the delivery of the program. Verification or evaluation may include, but is not limited to, telephone survey, site visit, billing analysis, and pre- and post-installation of monitoring equipment as necessary to quantify actual energy savings.

RULES AND REGULATIONS:

Service under this Schedule is subject to the General Rules and Regulations contained in the tariff of which this Schedule is a part, and to those prescribed by regulatory authorities.

Issued: November 26, 2014 **Effective:** January 1, 2015
Advice No. 14-07

Issued by Pacific Power & Light Company

By: R. Bryce Dalley **Title:** Vice President, Regulation

Attachment 1

Cadmus September 18, 2015 Results Memo

CADMUS

MEMORANDUM

To:	Nikki Kaparvich, PacifiCorp
From:	Jason Christensen and Danielle Kolp, Cadmus
Subject:	Impact Results for Washington See Ya Later, Refrigerator
Date:	September 18, 2015

Pacific Power contracted with Cadmus to conduct an impact evaluation of its appliance recycling program called See ya later, refrigerator® (SYLR) Program for the 2013 and 2014 program years. To evaluate program gross and net energy savings for the impact evaluation, Cadmus used a method that largely mirrored the 2011-2012 SYLR evaluation and is consistent with the Uniform Methods Project (UMP). The Cadmus evaluation included use of aggregated *in situ* metering dataset composed of over 600 appliances that were metered for evaluations conducted in California, Wisconsin, and Michigan, conducted 126 telephone surveys with program participants, and a review of the program tracking data. This memo summarizes the evaluation findings for the refrigerator and freezer savings. Evaluated saving estimates for program kits containing energy efficient light bulbs and findings regarding program processes are not included in this memo, but will be in the final report.

Summary of Key Findings

Key Impact Findings

The key impact evaluation findings are:

- In 2013, the SYLR Program recycled 1,304 refrigerators and freezers; in 2014, participation decreased to 1,166. The program achieved 806,583 kWh net savings, roughly 53% of the reported savings of 1,535,138 over the two-year period[1].
- The part-use factor (portion of the year that the equipment is in operation) fell within expected ranges to 0.96 for refrigerators and 0.94 for freezers. This part-use factor is part of the gross per-unit savings calculation.
- After adjusting for part use, the gross per-unit savings were 1,112 kWh for refrigerators, down from 1,152 in 2011-2012, and 964 kWh for freezers, down from 978 in 2011-2012. Neither gross savings estimate is statistically different from the 2011-2012 evaluation estimates.
- The net per-unit savings were 328 kWh for refrigerators and 321 kWh for freezers. These values are lower than the evaluated per-unit savings for 2011-2012.[2] The main reason for this decline

[1] Kit savings are not included as evaluated savings were not yet determined.

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was because a relatively large proportion of survey respondents indicated that, absent the program, they would have disposed of their appliance in a way that would have permanently removed the appliance from the grid (roughly 60% of respondents).

- Overall net-to-gross (NTG), including kits, decreased from 52% in the 2011-2012 evaluation to 30%[3].

Table 1 summarizes program participation, reported savings, and evaluated gross and net savings for 2013 and 2014.[4] The evaluated total net savings for the program are lower than the reported total savings primarily because of the lower NTG ratio. Absent the decrease in the NTG the net realization rate would have been 92%.

Table 1. 2013 and 2014 Program Savings by Measure

Measure	Evaluated Participation	Evaluated Gross Savings (kWh)	Reported Savings (kWh)	Evaluated Net Savings (kWh)	Net Realization Rate
Refrigerator Recycling	1,959	2,177,781	1,274,688	642,552	50%
Freezer Recycling	511	492,829	260,450	164,031	63%
Total	**2,470**	**2,670,610**	**1,535,138**	**806,583**	**53%**

Methodology

This memo presents two types of evaluated savings: gross and net. To determine these values, Cadmus applied four steps (Table 2). The evaluation defined reported gross savings as the electricity savings (kWh) that Pacific Power included in its 2013 and 2014 annual program reports.

Table 2. Impact Estimation Steps

Saving Estimate	Step	Action
Evaluated Gross Savings	1	Verify accuracy of data in program database
	2	Perform statistical/engineering analysis to evaluate per-unit savings
	3	Adjust evaluated gross savings with installation rate/part-use factor
Evaluated Net Savings	4	Apply net-to-gross adjustments

Step one involved verifying the accuracy of data by reviewing the program tracking database to ensure that participation and reported savings matched the 2013 and 2014 annual reports.

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[2] Evaluated per-unit net savings in the 2011-2012 evaluation were 583 kWh for refrigerators and 495 kWh for freezers with a NTG of 50.6% and 50.5% respectively.

[3] Again, energy savings kit savings were not final at the time this memo was written. The program-level NTG ratio will increase slightly once kit savings are included as kits have a 100% NTG.

[4] Throughout this report, the table totals may not sum due to rounding. Precision estimates, for means and totals (such as savings), are expressed in relative terms, while those for proportions and ratios (such as NTG) are expressed in absolute terms.

Step two was to perform a statistical/engineering analysis to evaluate per-unit savings that involved estimating refrigerator and freezer savings.

Step three was to adjust the evaluated gross savings with the installation rate/part-use factor by determining the mean proportion of the year in which recycled appliances were used. Using a telephone survey, Cadmus collected information to estimate the part-use factor, which it then used to calculate evaluated gross savings.

Step four was to apply the NTG adjustments to determine the net savings. After conducting participant surveys, Cadmus estimated freeridership, secondary market effects (i.e., the program's impact on the availability of used appliances), and induced replacement.[5]

Telephone Survey Sampling Approach

Cadmus developed survey samples of randomly selected program participants. The evaluation determined sample sizes assuming a 0.5 coefficient of variation (CV) and applying a finite population correction to determine the necessary sample size. Cadmus randomly surveyed 126 participants from the population of 2,322 unique participants. Table 3 shows the planned and achieved sample sizes by target group.

Table 3. Sample Sizes by Target Group

Target Group	Population	Target Sample Size	Achieved Sample Size
Refrigerators	1,844	66	66
Freezers	478	60	60
Total	**2,322**	**126**	**126**

Uniform Methods Project and Regional Technical Forum Protocols

Cadmus' impact evaluation methodology for the 2013-2014 program years was the same as for the 2011-2012 evaluation and was informed by guidelines developed by the U.S. Department of Energy.

This evaluation follows the methodology described in the refrigerator recycling protocol, which largely mirrors the method Cadmus used in evaluation of the 2011-2012 SYLR evaluation and is consistent with the Uniform Methods Project (UMP) and the Regional Technical Forum (RTF). More information about the UMP is available on the Department of Energy's website.[6]

A detailed comparison of Cadmus' approach with the RTF approach is included in Table 12.

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[5] This memo's Net-to-Gross section provides a description of how Cadmus estimated these parameters.

[6] National Renewable Energy Laboratory. "Chapter 7: Refrigerator Recycling Evaluation Protocol" Last modified April, 2013. Accessed September 17, 2015. http://energy.gov/sites/prod/files/2013/11/f5/53827-7.pdf

Evaluated Gross Savings

Gross Annual Unit Energy Consumption

Cadmus used the UMP-specified regression model to estimate unit energy consumption (UEC) for refrigerators and used an analogous model developed by Cadmus outside of UMP to estimate freezer UEC. The coefficient of each independent variable indicates the influence of that variable on daily consumption, holding all other variables constant.

- A positive coefficient indicates an upward influence on consumption
- A negative coefficient indicates a downward effect on consumption

The value of the coefficient indicates the marginal impact of a one-point increase in the independent variable on the UEC. For example, a 1-cubic foot increase in refrigerator size results in a 0.059 kWh increase in daily consumption.

In the case of dummy variables, the value of the coefficient represents the difference in consumption if the given condition is true. For example, in Cadmus' refrigerator model, the coefficient for the variable indicating whether a refrigerator was a primary unit is 0.560; this means that, all else being equal, a primary refrigerator consumes 0.560 kWh more per day than a secondary unit.

Refrigerator Regression Model

Table 4 shows the UMP model specification Cadmus used to estimate annual energy consumption of refrigerators in 2013 and 2014, along with the model's estimated coefficients.

Table 4. Refrigerator UEC Regression Model Estimates
(Dependent Variable = Average Daily kWh, R-square = 0.30)

Independent Variables	Coefficient	p-Value
Intercept	0.805	0.166
Age (years)	0.021	0.152
Dummy: Manufactured Pre-1990	1.036	<.0001
Size (cu. ft.)	0.059	0.044
Dummy: Single Door	-1.751	<.0001
Dummy: Side-by-Side	1.120	<.0001
Dummy: Primary	0.560	0.008
Interaction: Unconditioned Space x HDDs	-0.040	0.001
Interaction: Unconditioned Space x CDDs	0.026	0.188

* Cooling Degree Days (CDDs) and Heating Degree Days (HDDs) are the weighted average from Typical Meteorological Year (TMY3) data for weather stations that Cadmus mapped to participating appliance ZIP codes. TMY3 uses median daily values for a variety of weather data collected from 1991–2005.

Freezer Regression Model

Table 5 details the final model specifications Cadmus used to estimate the energy consumption of participating freezers, along with the results.

Table 5. Freezer UEC Regression Model Estimates
(Dependent Variable = Average Daily kWh, R-square = 0.38)

Independent Variables	Coefficient	p-Value
Intercept	-0.955	0.237
Age (years)	0.045	0.001
Dummy: Manufactured Pre-1990	0.543	0.108
Size ($ft.^3$)	0.120	0.002
Dummy: Chest Freezer	0.298	0.292
Interaction: Unconditioned Space x HDDs	-0.031	<.0001
Interaction: Unconditioned Space x CDDs	0.082	0.028

* Cooling Degree Days (CDDs) and Heating Degree Days (HDDs) are the weighted average from Typical Meteorological Year (TMY3) data for weather stations that Cadmus mapped to participating appliance ZIP codes. TMY3 uses median daily values for a variety of weather data collected from 1991–2005.

Extrapolation

After estimating the final regression models, Cadmus analyzed the corresponding characteristics (the independent variables) for participating appliances (as captured in the program administrator's program database). Table 6 summarizes the program averages or proportions for each independent variable.

Table 6. 2011-2012 Participant Mean Explanatory Variables

Appliance	Independent Variables	Participant Population Mean Value
Refrigerator	Age (years)	23.91
	Dummy: Manufactured Pre-1990	0.48
	Size ($ft.^3$)	18.36
	Dummy: Single Door	0.07
	Dummy: Side-by-Side	0.22
	Dummy: Primary	0.62
	Interaction: Unconditioned Space x HDDs*	5.22
	Interaction: Unconditioned Space x CDDs*	0.76
Freezer	Age (years)	30.65
	Dummy: Manufactured Pre-1990	0.74
	Size ($ft.^3$)	18.18
	Dummy: Chest Freezer	0.18
	Interaction: Unconditioned Space x HDDs*	13.1
	Interaction: Unconditioned Space x CDDs*	1.88

* Cooling Degree Days (CDDs) and Heating Degree Days (HDDs) are the weighted average from Typical Meteorological Year (TMY3) data for weather stations that Cadmus mapped to participating appliance ZIP codes. TMY3 uses median daily values for a variety of weather data collected from 1991–2005.

To estimate the average annual UEC, Cadmus applied the model coefficients to the independent variables. For example, using values from Table 5 and Table 6, the estimated annual UEC for freezers can be calculated as:

$$Freezer\ UEC = 365.25\ days * (-0.955 + 0.045 * [30.65\ years\ old] + 0.543 * [74\%\ units\ manufactured\ pre - 1990] + 0.12 * [18.18\ ft.^3\ ] + 0.298 * [18\%\ units\ that\ are\ chest\ freezers] - 0.031 * [13.1\ HDDs] + 0.082 * [1.88\ CDD]) = 1{,}026\ kWh$$

UEC Summary

Table 7 reports the evaluated average annual UEC for refrigerators and freezers recycled through the SYLR Program during 2013 and 2014. The section following the table describes adjustments Cadmus made to these estimates to determine the gross per-unit savings estimates for participant refrigerators and freezers.

Table 7. Estimates of Per-Unit Annual Energy Consumption

Appliance	*Ex Post* Annual UEC (kWh/year)	Relative Precision (90% confidence)
Refrigerators	1,158	10%
Freezers	1,026	19%

Appliance Part-Use Factor

Participants used some of the refrigerators and freezers recycled through the program for part of the year. Cadmus calculated and applied a prospective part-use value to account for how appliances were used historically prior to being recycled as well as how they would likely have been used if the program had not been available—for example, if a primary appliance would have been relocated and used as a secondary absent the program. The part-use calculation methodology is identical to the one used in the 2011-2012 evaluation.

The information about how refrigerators and freezers were operated prior to recycling is in Table 8 and the likely future usage scenarios are in Table 9. The final part-use factor for SYLR's 2013-2014 refrigerators is 0.96 and freezers is 0.94.[7]

[7] Since the future usage of discarded refrigerators is unknown, Cadmus applied the weighted average part-use value of all refrigerators that would have been discarded independent of the program (0.91). This approach acknowledges that the next owner of a discarded appliance might use it as a primary or secondary unit.

Table 8. Historical Part-Use Factors by Category

Usage Type and Part-Use Category	Refrigerators			Freezers		
	Percent of Recycled Units	Part-Use Factor	Per-Unit Energy Savings (kWh/year)	Percent of Recycled Units	Part-Use Factor	Per-Unit Energy Savings (kWh/year)
Secondary Units Only	n=23					
Not in Use	9%	0.00	0			
Used Part Time	0%	0.00	0			
Used Full Time	91%	1.00	1,158			
Weighted Average	**100%**	**0.91**	**1,057**			
All Units (Primary and Secondary)	n=64			n=58		
Not in Use	3%	0.00	0	2%	0.00	0
Used Part Time	0%	0.00	0	7%	0.38	385
Used Full Time	97%	1.00	1,158	91%	1.00	1,026
Weighted Average	**100%**	**0.97**	**1,122**	**100%**	**0.94**	**964**

Table 9. Prospective Part-Use Factors by Appliance Type

Use Prior to Recycling	Likely Use Independent of Recycling	Refrigerator		Freezer	
		Part-Use Factor	Percent of Participants	Part-Use Factor	Percent of Participants
Primary	Kept (as primary unit)	1.00	6%		
	Kept (as secondary unit)	0.91	5%		
	Discarded	0.97	51%		
Secondary	Kept	0.91	12%	0.94	20%
	Discarded	0.97	26%	0.94	80%
Overall		**0.96**	**100%**	**0.94**	**100%**

Net-to-Gross

Cadmus used the following formula to estimate net savings for recycled refrigerators:

$$Net\ savings = Gross\ Savings - Freeridership\ and\ Secondary\ Market\ Impacts - Induced\ Replacement$$

Where:

Gross Savings = The evaluated *in situ* UEC for the recycled unit, adjusted for part-use;

Freeridership and

Secondary Market Impacts	=	Program savings that would have occurred in the program's absence;
Induced Replacement	=	Average additional energy consumed by replacement units purchased due to the program.

Applying the UMP and RTF protocol requires an additional parameter related to net savings—secondary market impacts—and involves a decision-tree approach to calculating and presenting net program savings.

The decision tree—populated by the responses of surveyed participants and assumptions outlined in the UMP—presents savings under all possible scenarios concerning the participants' actions about the discarded equipment. Cadmus used a weighted average of savings under these scenarios to calculate the net savings attributable to the program. This approach is also the same as the 2011-2012 evaluation. Full details of the freeridership, secondary market impacts, and induced replacement will be included in the full evaluation report.

The refrigerator full NTG decision tree is presented in Figure 1 and the freezer full NTG decision tree is presented in Figure 2.

Figure 1. Refrigerator Full NTG Decision Tree

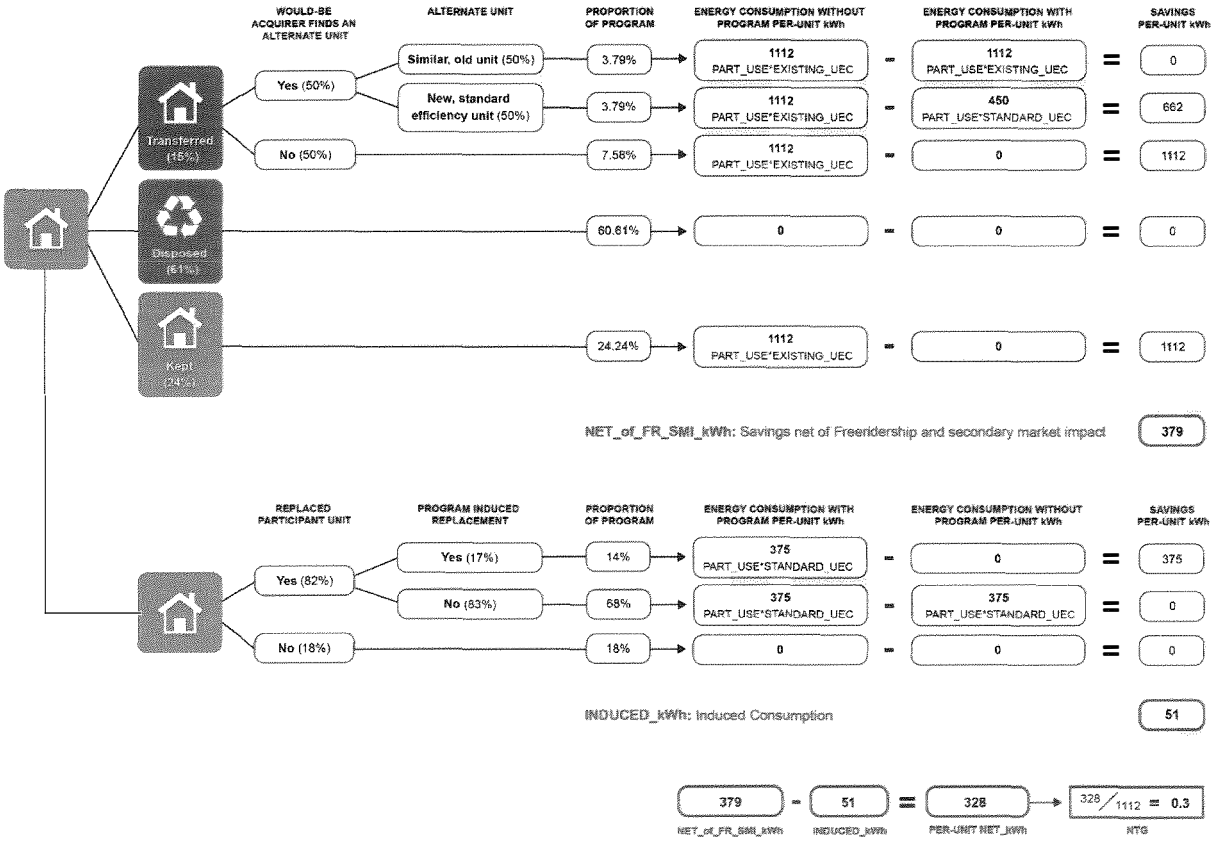
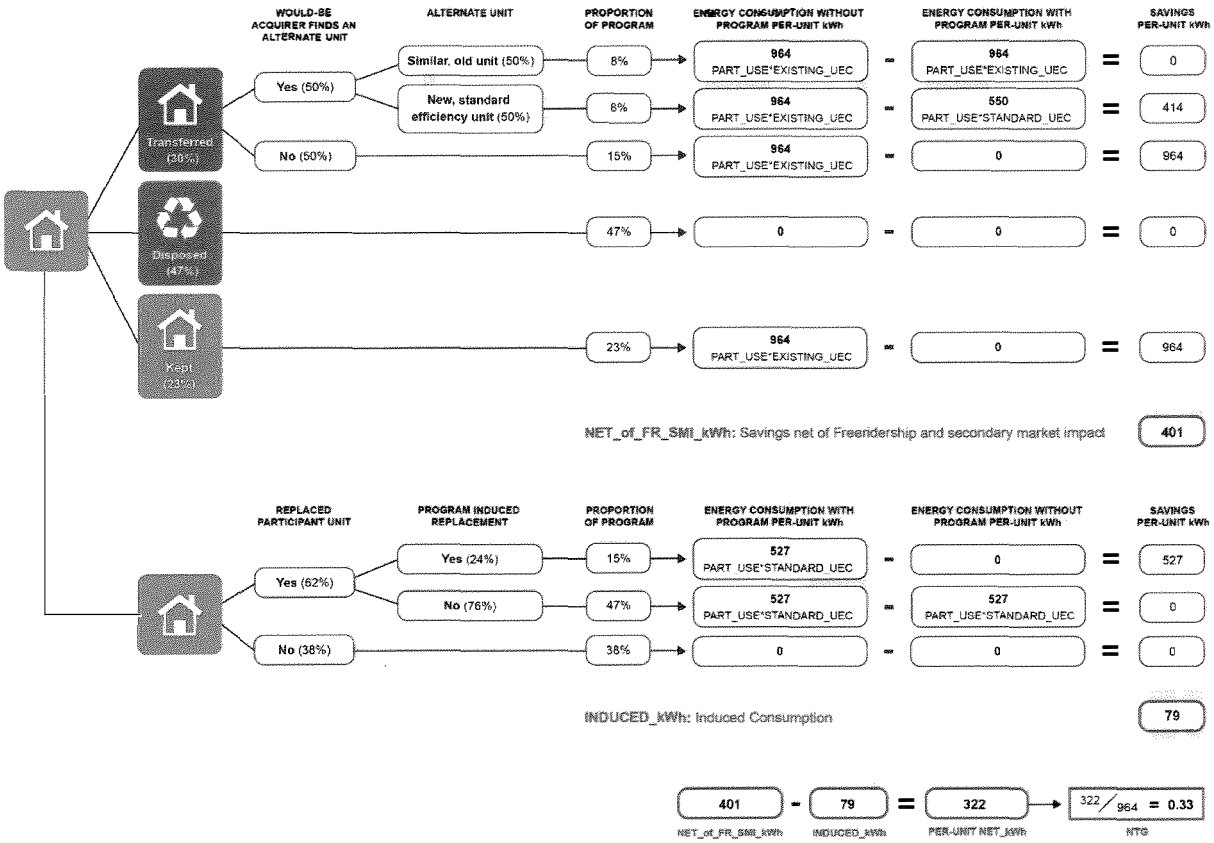


Figure 2. Freezer Full NTG Decision Tree



As shown in Table 10, Cadmus determined the final net savings as gross savings less freeridership, secondary market impacts, and induced replacement kWh.

Table 10. 2013 and 2014 NTG Ratios – UMP Assumptions

Scenario	Gross Per-Unit Savings	Freeridership and Secondary Market Impacts (kWh)	Induced Replacement (kWh)	Net Savings (kWh)	NTG
Refrigerator	1,112	733	51	328	30%
Freezer	964	564	79	321	33%

The assumptions used in Figure 1 and Figure 2 are consistent with those described in the UMP. However, the RTF does include different assumptions regarding the distribution of would-be acquirers who find an alternate unit (the first of the columns with the grey background in both figures).

Cadmus also calculated the NTG ratio with the RTF assumptions, which leads to a lower NTG. These results are presented in Table 11.

Table 11. 2013 and 2014 NTG Ratios – RTF Assumptions

Appliance	Gross Savings (kWh)	Freeridership and Secondary Market Impacts (kWh)	Induced Consumption (kWh)	Total Program Net Savings (kWh)	NTG
Refrigerator	1,112	762	51	299	27%
Freezer	964	620	79	265	27%

The RTF assumes that 75% of would-be acquirers would find an alternate unit rather than the 50% split assumed in the UMP (all other factors in the NTG decision tree are identical). This difference means that the net reduction in appliances operating on the grid is smaller than assumed by the UMP, thus leading to lower net savings.

Impact Analysis Inputs and RTF Savings Calculation Inputs

Cadmus's impact evaluation methodology aligned with the RTF's methodology for calculating savings. However, since Cadmus used some inputs that are specific to Pacific Power's program in 2013 and 2014, there are some differences in specific values, as described in Table 12.

Table 12. Cadmus Impact Analysis Inputs and RTF Savings Calculation Inputs

	RTF		Cadmus	
Parameter	Value	Sources	Value	Sources
Part-Use Factor	Refrigerator - 91% Freezer - 91%	Weighted average of Impact Evaluation studies: Avista 2011; PacifiCorp ID 2011-2012; PacifiCorp WA 2011-2012	Refrigerator - 96% Freezer - 94%	Participant survey
Base Year	2011	This year is used to define profile of age of recycled units.	Not applicable; Cadmus *in situ* regression accounts for these factors	
Annual Degradation Factor	1.25%	ADM Associates, NV Energy 2009 Refrigerator Recycling Program M&V Report, 2010		
In Situ Factor	0.81	Cadmus Group, CA Residential Retrofit High Impact Measure Evaluation Report, 2010		

	RTF		Cadmus	
Parameter	Value	Sources	Value	Sources
Left on Grid Factor	Refrigerator - 66% Freezer - 66%	Weighted average of Impact Evaluation study results: Avista 2010-2011; PacifiCorp ID 2011-2012; PacifiCorp WA 2011-2012; ETO 2011 Fasttrack Report	Refrigerator- 39% Freezer- 53%	Average of participant survey (transfer + kept from UMP diagram)
Kept Factor	Refrigerator- 7% Freezer- 13%	Weighted average of Impact Evaluation study results: Avista 2010-2011; PacifiCorp ID 2011-2012; PacifiCorp WA 2011-2012; ETO 2011 Fasttrack Report	Refrigerator- 24% Freezer- 23%	Participant survey
Induced Replacement (R1)	Refrigerator- 6% Freezer- 6%	Avista 2010-2011; PacifiCorp WA 2010-2011	Refrigerator- 14% Freezer- 15%	Participant survey
Replacement by Would-be Owner (R2)	0.75	RTF updated from 0.5 but no source cited.	0.5	Same as RTF/UMP
Fraction of New replacement units	R1 case: 79% R2 case: 59%	Applies to refrigerators only. R1 case source: JACO 2012-2013 Program Data; R2 case source: ADM 2004-2005 CA Statewide survey	R1: Refrigerator- 90% Freezer-89% R2: 50%	R1: Participant survey R2: Deemed from UMP
C-Factor	Refrigerator: -2% Freezer: 1%	JACO data, average efficiency improvement from program year 2010 to 2011; and 2009 to 2010.	Not applicable; Cadmus *in situ* regression accounts for these factors	

Attachment 2

Navigant Memo Dated September 10, 2015

NAVIGANT

1375 Walnut Street
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Memorandum

To: **Don Jones Jr., PacifiCorp/Rocky Mountain Power**

From: **David Basak, Navigant**

Date: **September 10, 2015**

Re: **Cost Effectiveness for the See Ya Later Refrigerator Program - Washington**

Navigant has developed this memo in response to PacifiCorp's proposed See Ya Later Refrigerator Program cost effectiveness modeling needs in the state of Washington.

This memo presents the cost effectiveness results of individual analysis runs for the state of Washington. Each scenario is analyzed using modeled assumptions provided by PacifiCorp. These scenarios utilize the following assumptions:

- ***Avoided Costs:*** Navigant utilized the "West" 61% Plug Loads decrement provided in the 2015 PacifiCorp Integrated Resource Plan along with the Washington Residential Plug load shape to calculate avoided costs.
- ***Modeling Inputs:*** Navigant utilized individual measure savings provided by PacifiCorp in the file *NTG method for PC.xlsx* and *JACO 2015 Pricing Oct-2014.pdf*.
- ***Energy Rates:*** Navigant utilized the 2014 rates provided by PacifiCorp and applied an escalation of 1.9% to arrive at estimated rates for PY2016.
- ***Line Loss Factors:*** Navigant utilized the residential line loss factor throughout the analysis.
- ***Evaluation Period:*** The evaluation period for this analysis uses program year 2016 as year one.

This memo will begin by addressing the inputs used in the analysis of the Washington See Ya Later Program. The cost-effectiveness inputs are as follows:

Table 1 – SYLR Inputs

Parameter	Value
Discount Rate	6.66%
Residential Line Loss	9.67%
Residential Energy Rate ($/kWh)	$0.0873
Inflation Rate[1]	1.90%

[1] Future rates determined using a 1.9% annual escalator.

Table 2 – SYLR Annual Program Costs

Measure Group	Unit Marketing	Unit Labor / Admin	Incentives	Total Utility Costs	Gross Customer Costs
Refrigerator – res/business pick- up	$25.00	$78.00	$30.00	$133.00	$0.00
Freezer – res/business pick-up	$25.00	$78.00	$30.00	$133.00	$0.00
Refrigerator – retailer pick-up	$0.00	$72.00	$20.00	$92.00	$0.00
Freezer – retai er pick-up	$0.00	$72.00	$20.00	$92.00	$0.00
Refrigerator – retailer pick-up – RTF for would be acquirer	$0.00	$72.00	$20.00	$92.00	$0.00

Table 3 – SYLR Savings by Measure Category

Measure Group	Gross kWh Savings	Realization Rate	Adjusted Gross kWh Savings	Net to Gross Ratio	Net kWh Savings	Measure Life
Refrigerator – res/business pick- up	1,112	100%	1,112	30%	328	6
Freezer – res/business pick-up	964	100%	964	33%	321	5
Refrigerator – retailer pick-up	1,112	100%	1,112	30%	328	6
Freezer – retai er pick-up	964	100%	964	33%	321	5
Refrigerator – retailer pick-up – RTF for would be acquirer	1,112	100%	1,112	27%	299	6

The PY2016 cost/benefits results at the measure level are as follows:

Table 4 – SYLR Level Cost-Effectiveness Results (Refrigerator – res/business pick- up)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	$0.0793	$133	$108	-$25	0.81
Total Resource Cost Test (TRC) No Adder	$0.0793	$133	$98	-$35	0.74
Utility Cost Test (UCT)	$0.0793	$133	$98	-$35	0.74
Rate Impact Test (RIM)		$290	$98	-$192	0.34
Participant Cost Test (PCT)		$0	$561	$561	n/a
Lifecycle Revenue Impacts ($/kWh)					$0.000000008

Table 5 – SYLR Level Cost-Effectiveness Results (Freezer – res/business pick-up)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	$0.0951	$133	$89	-$44	0.67
Total Resource Cost Test (TRC) No Adder	$0.0951	$133	$80	-$53	0.60
Utility Cost Test (UCT)	$0.0951	$133	$80	-$53	0.60
Rate Impact Test (RIM)		$264	$80	-$183	0.31
Participant Cost Test (PCT)		$0	$422	$422	n/a
Lifecycle Revenue Impacts ($/kWh)					$0.000000009

Table 6 – SYLR Level Cost-Effectiveness Results (Refrigerator – retailer pick-up)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	$0.0548	$92	$108	$16	1.17
Total Resource Cost Test (TRC) No Adder	$0.0548	$92	$98	$6	1.06
Utility Cost Test (UCT)	$0.0548	$92	$98	$6	1.06
Rate Impact Test (RIM)		$249	$98	-$151	0.39
Participant Cost Test (PCT)		$0	$551	$551	n/a
Lifecycle Revenue Impacts ($/kWh)					$0.000000006

Table 7 – SYLR Level Cost-Effectiveness Results (Freezer – retailer pick-up)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	$0.0658	$92	$89	-$3	0.96
Total Resource Cost Test (TRC) No Adder	$0.0658	$92	$80	-$12	0.87
Utility Cost Test (UCT)	$0.0658	$92	$80	-$12	0.87
Rate Impact Test (RIM)		$223	$80	-$142	0.36
Participant Cost Test (PCT)		$0	$412	$412	n/a
Lifecycle Revenue Impacts ($/kWh)					$0.000000007

Table 8 – SYLR Level Cost-Effectiveness Results (Refrigerator – retailer pick-up – RTF for would be acquirer)

Cost-Effectiveness Test	Levelized $/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	$0.0602	$92	$98	$6	1.07
Total Resource Cost Test (TRC) No Adder	$0.0602	$92	$89	-$3	0.97
Utility Cost Test (UCT)	$0.0602	$92	$89	-$3	0.97
Rate Impact Test (RIM)		$235	$89	-$146	0.38
Participant Cost Test (PCT)		$0	$551	$551	n/a
Lifecycle Revenue Impacts ($/kWh)					$0.000000006

Attachment 3

Customer Notice

Keeping You Informed

Proposed service changes

On November 19, 2015, Pacific Power & Light Company (Pacific Power) submitted an advice filing with the Washington Utilities and Transportation Commission (Commission) to cancel Schedule 107, Refrigerator Recycling Program, and Schedule 71, Energy Exchange Program, effective January 1, 2016.

The Refrigerator Recycling program has been offered to Washington customers as an incentive to recycle older, less-efficient refrigerators and freezers to deliver energy savings. Recent analysis indicates the program is no longer a cost-effective method to deliver energy savings. As a result, Pacific Power is requesting Commission approval to cancel the current program.

The Energy Exchange Program has been offered to Washington large commercial and industrial customers to provide optional load curtailment when needed by the company. Due to the lack of customer participation, Pacific Power is proposing to discontinue offering the service.

You are invited to comment to the Commission by using the "Submit a Comment" feature on the Commission's website at utc.wa.gov, or by using the contact information below. Commission staff will make a recommendation to the commissioners at an open meeting in Olympia. These meetings are scheduled every other Tuesday at 9:30 a.m. Please contact the Commission to request to be notified of the scheduled open meeting at which the proposal will be considered by the Commission.

You will have an opportunity to comment in person at this meeting. The Commission is committed to providing reasonable accommodation to participants with disabilities. If you need reasonable accommodation, please contact the Commission at 360-664-1132 or human_resources@utc.wa.gov.

If you are unable to attend the open meeting, the Commission has a bridge line that allows you to participate by telephone. Call 360-664-1234 the day before the open meeting for instructions and to sign in.

Washington Utilities and Transportation Commission

1300 S. Evergreen Park Drive SW
P.O. Box 47250, Olympia, WA 98504-7250
Email: comments@utc.wa.gov
Telephone: 1-888-333-WUTC (9882)

For more information on Pacific Power's energy efficiency programs, visit **bewattsmart.com**. Or to contact Pacific Power, please call us toll free at **1-888-221-7070** or write to:

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